Brazilian Journal of Psychiatry
bjp
Revista Brasileira de Psiquiatria

Braz J Psychiatry. 2026;48:e20254437
doi:10.47626/1516-4446-2025-4437
Brazilian Psychiatric Association

ORIGINAL ARTICLE

The prevalence of schizophrenia in Brazil: social vulnerability as a key consideration for care and policy

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Objective: Recent studies have highlighted variability in schizophrenia prevalence according to sociodemographic and environmental factors. Brazil lacks updated, nationally representative data. This study aimed to estimate the lifetime prevalence of schizophrenia in Brazil using a representative national sample and to examine associations with sociodemographic factors such as sex, age, income, education, and geographic region.
Methods: Data were analyzed from adult respondents (aged $\geqslant$ 18 years) of the 2019 National Health Survey, which employed a multistage, clustered sampling strategy representing the Brazilian population (n=159,171,311). Schizophrenia diagnosis was self-reported. Weighted analyses, bivariate and multivariable logistic regression models were used to examine associations between sociodemographic factors and schizophrenia diagnosis.
Results: The estimated lifetime prevalence of self-reported schizophrenia was 0.34%. In multivariable analyses, the prevalence was higher among men, individuals aged 40–59, those with lower income, urban residents, those living without a partner, and the unemployed. A clear gradient was observed for education in bivariate analysis, with a higher prevalence among those with lower attainment (0.75%); however, this was not significant in the multivariable model.
Conclusions: Schizophrenia is observed across all regions of Brazil, affecting approximately 547,202 individuals. Findings on social determinants replicate previous results. The overrepresentation of socially vulnerable groups underscores the need to address social determinants of health and implement supportive policies.

Keywords: Schizophrenia; social determinants of health; socioeconomic factors; urban population; Brazil

Introduction

Prevalence estimates of medical conditions play a crucial role in shaping clinical decisions and public policies.[1,2] For many decades, the prevalence of schizophrenia was reported as 1%, and the incidence was regarded as comparable among different countries, suggesting a relative independence from environmental factors.[3,4] In the past 2 decades, point-prevalence estimates have decreased to approximately 0.28%, whereas significant variations in prevalence and incidence have been acknowledged between and within countries.[5,6] Consequently, local prevalence estimates cannot rely solely on international studies; they must be

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Submitted Jul 16 2025, accepted Oct 24 2025.

How to cite this article: Gadelha A, Ziebold C, Lorencetti PG, da Silva NR, Faisal-Cury A, Rodrigues DMO, et al. The prevalence of schizophrenia in Brazil: social vulnerability as a key consideration for care and policy. Braz J Psychiatry. 2026;48:e20254437. http://doi.org/10.47626/1516-4446-2025-4437

contextualized within specific social, genetic, and environmental frameworks.

Accurately estimating the prevalence of schizophrenia poses significant challenges. Prevalence estimates vary significantly among studies, influenced by factors such as the method of ascertainment, the population studied, and whether lifetime or point prevalence is assessed.[7,8] Furthermore, factors such as economic inequalities and environmental exposures have been linked to variations in disease prevalence, including higher rates in urban compared to rural areas, and in lower-income compared to higher-income neighborhoods.[9] Given the relatively low prevalence of schizophrenia and its uneven population distribution, large, diverse sample sizes are required to produce reliable estimates. Systematic reviews highlight the scarcity of studies with representative samples, underscoring the need for more epidemiological studies, especially in low- and middle-income countries.[8,10]

Brazil is a large, multiethnic, and environmentally diverse country that has produced few prevalence estimates for schizophrenia. The few available studies primarily derived prevalence estimates from large outpatient or inpatient services, limiting the generalizability of their findings.[11,12] Only three studies have examined representative samples.[13-15]

Almeida-Filho et al.[13] assessed 6,476 subjects in three large metropolitan areas in the 1990s, reporting wide differences in lifetime prevalence of schizophrenia, ranging from 0.3% in Brasília to 2.2% in Porto Alegre. Andrade et al.,[14] examined a representative sample of two neighborhoods in the city of São Paulo, estimating a lifetime prevalence of 1.9%. Despite the high quality of these studies, neither can be considered representative of the entire Brazilian population. Theme-Filha et al.[15] examined the prevalence of six chronic diseases, including schizophrenia, using a probabilistic two-stage sampling design with stratification by urban/rural area and municipality size, which increases national representativeness. They reported a point prevalence of 1.7% for schizophrenia.[15] However, the study assessed only 5,000 adults selected from 250 census tracts – representing approximately 0.05% of all census tracts in Brazil, which limits statistical power for detecting and analyzing less prevalent conditions such as schizophrenia.[15] In addition, the Global Burden of Disease project incorporated Brazilian data in its latest assessment, reporting a prevalence of 0.28% for schizophrenia.[6] This estimate was derived from statistical modeling based on multiple sources of information.[6]

The Brazilian government has conducted three nationwide health surveys, the most recent being in 2019, which included interviews with 94,114 individuals. These surveys provide comprehensive data on health status, lifestyle, health care access, and mental health conditions, including schizophrenia. The 2019 dataset provides a robust basis for generating accurate, nationally representative estimates of the schizophrenia prevalence in Brazil, addressing key limitations of prior studies.

In this study, we aimed to estimate the lifetime prevalence of schizophrenia in Brazil using the most recent National Health Survey (Pesquisa Nacional de Saúde) data. We also examined potential associations with socioeconomic status, sex, race, and regional variation.

Methods

Data

We analyzed data from the 2019 National Health Survey, which gathered information from a representative sample of the Brazilian population aged $\geqslant$ 15 years in permanent households.[16] For this study, we used a subsample of participants aged $\geqslant$ 18 years to calculate the prevalence of schizophrenia diagnosis among the adult population in Brazil. The National Health Survey's sampling strategy followed a three-stage clustered approach: Stage 1: stratified selection of primary sampling units (census sectors or groups of sectors), with probability proportional to size based on the number of permanent private households; Stage 2: households were randomly selected from the National Address Register (Cadastro Nacional de Endereços para Fins Estatísticos); Stage 3: one resident aged $\geqslant$ 15 years was randomly selected from each chosen household.

A sample size of 108,525 households was determined based on data from the 2013 National Health Survey, considering factors such as chronic diseases, health service utilization, and lifestyle habits. Data were collected by trained interviewers using a standardized electronic questionnaire from August 2019 to March 2020.[16] In total, 94,114 individuals provided comprehensive data on health status, 91,683 of whom were adults (age $\geqslant$ 18 years).

Diagnosis of schizophrenia

The chronic diseases section of the questionnaire includes an item on whether a health care professional has ever diagnosed the respondent with a mental disorder. Those who answered affirmatively were then asked for more detailed information about their specific diagnoses. For this study, participants who reported being diagnosed with schizophrenia were classified as having a ''diagnosis of schizophrenia.''

Sociodemographic variables

Sociodemographic factors included: biological sex (male or female), age group (18-29, 30-39, 40-59, $>$ 59 years old), self-reported race (White, Black, mixed, Asian, Indigenous), *per capita* household income ($\leqslant$ minimum wage vs. $>$ minimum wage), education level (no education, basic incomplete, basic complete, secondary incomplete, secondary complete, university incomplete, university complete), region (North, Northeast, Midwest, Southeast, South), urbanicity (Urban or Rural), paid employment (Yes or No), and living with a partner (Yes or No).

Data analysis

Prevalence estimates of schizophrenia diagnosis were calculated overall and by sociodemographic groups. To account for the complex sampling design, which involved unequal probabilities of selection at each stage of the sampling process, expansion weights were applied to all analyses. These weights, computed as the inverse of the selection probabilities and adjusted for differential selection probabilities and non-response, ensured the representativeness of the sample. All analyses were conducted using the survey data analysis commands in STATA 18 to appropriately account for the survey design.

Three comparison methods were employed: survey-adjusted likelihood ratio tests, bivariate logistic regression, and multivariable logistic regression. The multivariable results were considered the primary findings. Survey-adjusted likelihood-ratio tests were employed to evaluate differences in the distribution of sociodemographic characteristics between individuals with and without a schizophrenia diagnosis.

Bivariate and multivariable logistic regression models were used to examine the association between sociodemographic factors (such as sex, age group, race, region, urbanicity, *per capita* household income, living with a partner, unemployment and education level) and the likelihood of being diagnosed with schizophrenia. In multivariable analyses, all variables with $p < 0.10$ in the bivariate analyses were included. Statistical significance was defined at the 5% level (two-tailed). In the multivariable model, we report both the variance inflation factor and the correlations between variables as indicators of multicollinearity. Variance inflation factor values > 5, along with > 2 predictors exhibiting correlations > 0.25, suggest a high degree of correlation among predictors.[17]

Ethics statement

This study was approved by Brazil's National Health Ethics Committee (CAAE: 11713319.7.0000.0008, n° 3.529.376), and participant consent was obtained. The data were anonymized and are publicly available on https://www.pns.icict.fiocruz.br/bases-de-dados/.

Results

Complete data on mental disorder diagnosis were available for 88,531 participants (96.2% response rate), with a weighted frequency of 159,171,311 (53.2% female), whose mean age was 44.93 years (standard error = 0.03). The estimated prevalence of self-reported schizophrenia diagnosis among individuals aged $\geqslant$ 18 years in Brazil in 2019 was 0.34% (95%CI 0.29-0.41), corresponding to an estimated 547,202 individuals.

Table 1 presents the weighted sociodemographic characteristics of the overall sample, stratified by schizophrenia diagnosis. The distribution of those who reported a schizophrenia diagnosis was highest in the 40-59 age group, and they were more often characterized by markers of socioeconomic vulnerability, including lower educational attainment, unemployment, and not living with a partner. According to the survey-adjusted likelihood-ratio tests (Supplementary Table S1), no significant differences were observed in the distribution of self-reported race, sex, urbanicity, or geographic region.

The prevalence of schizophrenia was 0.40% (95%CI 0.32-0.51) among men and 0.29% (95%CI 0.23-0.37) among women (Figure 1A). Regarding age, the highest prevalence was observed among individuals aged 40-59 years, with a rate of 0.53% (95%CI 0.43-0.66) (Figure 1B). As shown in Figure 1C, when examining the prevalence across age groups by sex, the prevalence of schizophrenia increased was higher in the 30-39 age group, especially the 40-59 age group, for both men and women. Notably, the rate among women tripled, while among men it increased 1.7 times. Among those aged $\geqslant$ 60 years, the prevalence decreased by 1.6 times in men, resulting in a similar rate to women (Figure 1C). Regarding race, the highest prevalence was observed among mixed-race individuals (0.37%, 95%CI 0.29-0.47) followed by White (0.34%, 95%CI 0.26-0.44), Black (0.29%, 95%CI 0.17-0.47), Indigenous (0.11%, 95%CI 0.02-0.81), and Asian (0.11%, 95%CI 0.02-0.80) individuals (Figure 1D).

Marked disparities emerged across educational levels (Figure 1E): individuals with no formal education had the highest prevalence (0.76%, 95%CI 0.45%-1.28), while the prevalence decreased progressively with greater educational attainment. Similarly, the schizophrenia prevalence was higher in individuals with lower *per capita* household income ($\leqslant$ minimum wage: 0.46%, 95%CI 0.38-0.57) (Figure 1I).

Across regions, the prevalence of schizophrenia was as follows: 0.22% (95%CI 0.14-0.33) in the North, 0.38% (95%CI 0.29-0.49) in the Northeast, 0.30% (95%CI 0.20-0.47) in the Midwest, 0.36% (95%CI 0.27-0.48) in the Southeast, and 0.33% (95%CI 0.21-0.49) in the South (Figure 1F). A modest urban-rural gradient was noted, with a higher prevalence among urban residents (0.36%, 95%CI 0.30-0.43) than rural residents (0.24%, 95%CI 0.16-0.36) (Figure 1G).

Unemployed respondents had a substantially higher prevalence (0.73%, 95%CI 0.61-0.88) than employed respondents (0.10%, 95%CI 0.07-0.15) (Figure 1J). The prevalence was also higher among those who were not living with a partner (0.51%, 95%CI 0.41-0.63) than those who were (0.24%, 95%CI 0.19-0.31) (Figure 1H). Figure 1 provides a comprehensive representation of schizophrenia prevalence across the aforementioned sociodemographic groups.

The results of the logistic regression analyses are presented in Table 2. In the bivariate analysis, older age, lower *per capita* household income, lower education level, unemployment, living without a partner, and residing in the Northeast or Southeast regions were associated with a higher likelihood of a self-reported schizophrenia diagnosis.

In the multivariable analysis, the likelihood of receiving a schizophrenia diagnosis was higher among men, individuals aged 30-59 (especially between 40-59 years), those with lower *per capita* household income, the

Table 1 Sociodemographic estimates of the sample, both overall and stratified by schizophrenia diagnosis (weighted frequencies)

Characteristic	No diagnosis of schizophrenia	Diagnosis of schizophrenia	Total
N	158,624,109 (99.7)	547,202 (0.3)	159,171,311 (100.0)
Sex			
Male	74,253,410 (46.8)	299,289 (54.7)	74,552,698 (46.8)
Female	84,370,700 (53.2)	247,913 (45.3)	84,618,613 (53.2)
Age group (years)			
18-29	35,137,059 (22.2)	42,283 (7.7)	35,179,342 (22.1)
30-39	33,335,008 (21.0)	76,667 (14.0)	33,411,675 (21.0)
40-59	55,882,565 (35.2)	298,876 (54.6)	56,181,441 (35.3)
⩾ 60	34,269,477 (21.6)	129,376 (23.6)	34,398,853 (21.6)
Race			
White	68,625,194 (43.3)	232,796 (42.5)	68,857,990 (43.3)
Black	18,203,835 (11.5)	52,351 (9.6)	18,256,186 (11.5)
Asian	1,461,680 (0.9)	1,643 (0.3)	1,463,323 (0.9)
Mixed	69,458,677 (43.8)	259,435 (47.4)	69,718,112 (43.8)
Indigenous	863,839 (0.5)	976 (0.2)	864,815 (0.5)
Education			
No education	9,627,138 (6.1)	73,986 (13.5)	9,701,124 (6.1)
Basic incomplete	45,393,083 (28.6)	226,167 (41.3)	45,619,250 (28.7)
Basic complete	12,313,097 (7.8)	34,042 (6.2)	12,347,139 (7.8)
Secondary incomplete	10,683,257 (6.7)	18,201 (3.3)	10,701,458 (6.7)
Secondary complete	47,337,544 (29.8)	119,758 (21.9)	47,457,302 (29.8)
University incomplete	8,137,599 (5.1)	17,604 (3.2)	8,155,204 (5.1)
University complete	25,132,390 (15.8)	57,445 (10.5)	25,189,835 (15.8)
Region			
North	12,467,525 (7.9)	27,110 (5.0)	12,494,635 (7.8)
Northeast	41,948,447 (26.4)	158,368 (28.9)	42,106,815 (26.5)
Southeast	68,899,654 (43.4)	248,841 (45.5)	69,148,495 (43.4)
South	23,297,574 (14.7)	76,151 (13.9)	23,373,724 (14.7)
Midwest	12,010,909 (7.6)	36,733 (6.7)	12,047,642 (7.6)
Urbanicity			
Urban	136,676,609 (86.2)	494,617 (90.4)	137,171,226 (86.2)
Rural	21,947,501 (13.8)	52,585 (9.6)	22,000,085 (13.8)
Paid employment			
Yes	97,422,978 (61.4)	97,430 (17.8)	97,520,408 (61.3)
No	61,201,131 (38.6)	449,772 (82.2)	61,650,903 (38.7)
Living with a partner			
Yes	97,462,522 (61.4)	235,254 (43.0)	97,697,775 (61.4)
No	61,161,587 (38.6)	311,948 (57.0)	61,473,536 (38.6)

Data presented as n (%).

unemployed, those living without a partner, and those living in urban areas, particularly in the Southeast region.

Discussion

This study offers a comprehensive examination of the prevalence of schizophrenia in Brazil, highlighting key sociodemographic factors that are associated with its distribution. The findings reveal that factors such as male sex, older age, lower *per capita* household income, unemployment, living without a partner, and urban residency are linked to a higher likelihood of reporting a schizophrenia diagnosis. A clear gradient in prevalence was observed across educational levels, with significant results in the survey-adjusted likelihood ratio test and the bivariate logistic regression, but not in the multivariable logistic regression.

Although the overall prevalence rate of 0.34% is slightly higher than that reported by recent large-scale studies and meta-analyses, it remains within their CIs.[6,10] It is important to consider the use of self-reported diagnoses in our study when comparing the results with other studies. Self-reported diagnoses of schizophrenia have shown a positive predictive value of 70% (95%CI 60.5-78.2), whereas that of research diagnoses was 81% (95% CI 72.3-87.7) when schizoaffective depressive disorder was included in the case definition.[18] In contrast, among patients receiving treatment for opioid use disorder, self-reported diagnoses of psychotic disorders demonstrated very high specificity (99.4%, 95%CI 98.5-99.8), substantially higher than that observed for self-reported

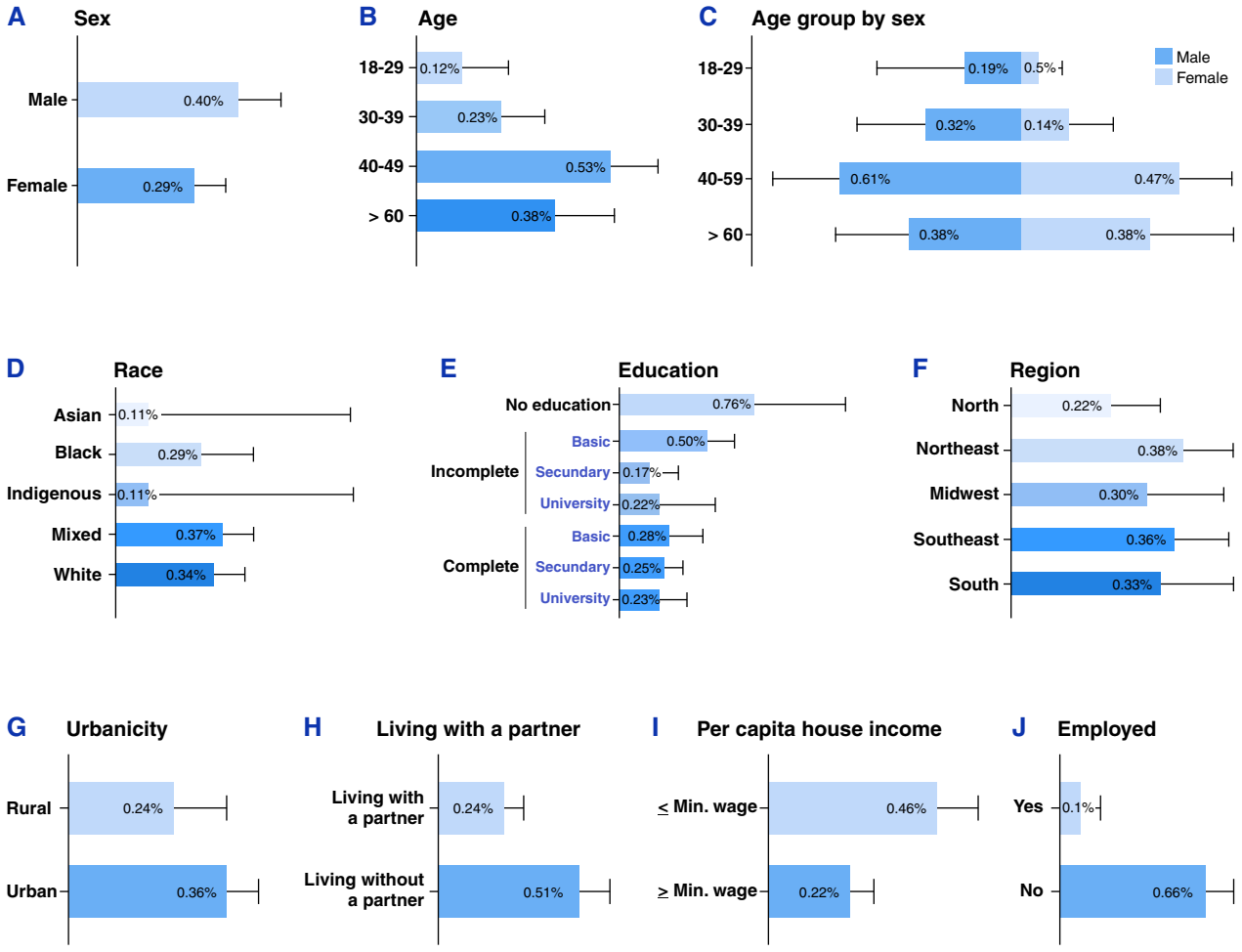

Figure 1 Prevalence (%) of schizophrenia across sociodemographic groups. Weighted prevalence estimates of schizophrenia are shown by sex (A), age group (B), age group stratified by sex (C), self-identified race (D), educational level (incomplete vs. complete) (E), geographic region (F), urbanicity (G), cohabitation status (H), *per capita* household income (I), and employment status (J). Prevalence values are expressed as percentages with 95%CIs and were estimated using sample weights from a nationally representative survey.

diagnoses of any psychiatric disorder (78.9%, 95%CI 73.6-83.6).[19] Given this high specificity, it is unlikely that the rate is inflated due to overreporting or overdiagnosis – especially considering the significant stigma associated with schizophrenia. However, it is also possible that factors such as limited access to treatment, and consequently diagnosis, may result in an underestimation of the true prevalence based on self-report. Furthermore, prevalence rates can be underestimated due to the fact that patients with schizophrenia may be institutionalized or lack a stable residence, and may not consent to participate in a household interview; they are also at risk of premature death, which would reduce their numbers in higher age strata.

Therefore, the true prevalence of schizophrenia may, in fact, be higher. Indeed, given the markedly reduced life expectancy of schizophrenia patients, over 15 years shorter than the general population[20] – morbid risk, which accounts for premature mortality – may be a more appropriate epidemiological metric rather than point prevalence. This has been estimated at a median of 0.72%.[21] However, these patterns and concerns likely extend to other countries as well.

The male-to-female ratio of 1.4 observed in our study is consistent with previous findings,[22] reinforcing the well-established notion that schizophrenia is more common in men. Moreover, the literature consistently reports sex differences in age of onset, with men typically experiencing earlier onset than women, as well as worse long-term outcomes.[23] These differences in age of onset and prognosis may contribute to the observed sex-based differences in schizophrenia prevalence, depending on factors such as sampling methods, population characteristics, and study design.

The age-related prevalence differences in our study likely reflect a cumulative effect, peaking at 40 to 59 years of age. The prevalence reduction after 60 years of age, especially among men, is aligned with the known higher mortality and 10-to-20-year shorter life expectancy in individuals with schizophrenia.[24,25] This trend was

Table 2 Logistic regression models: sociodemographic factors associated with schizophrenia diagnosis

	Bivariate analysis			Multivariable analysis[†]		
Characteristic	OR	95%CI	p-value	OR	95%CI	p-value
Sex						
Female	(Reference)				(Reference)	
Male	1.37	0.99-1.91	0.061	**2.67**	**1.90-3.75**	**< 0.001**
Age group (years)						
18-29	(Reference)				(Reference)	
30-39	1.91	0.81-4.52	0.140	**4.08**	**1.60-10.40**	**0.003**
40-59	**4.44**	**2.03-9.72**	**< 0.001**	**7.55**	**3.06-18.62**	**< 0.001**
⩾ 60	**3.14**	**1.35-7.27**	**0.008**	2.07	0.182-0.71	0.182
Race						
White	(Reference)			-		
Black	0.85	0.48-1.49	0.566			
Asian	0.33	0.05-2.41	0.276			
Mixed	1.10	0.77-1.57	0.596			
Indigenous	0.33	0.05-2.44	0.279			
Education						
No education	(Reference)					
Basic incomplete	0.65	0.36-1.17	0.149	0.77	0.40-1.48	0.432
Basic complete	**0.36**	**0.17-0.76**	**0.008**	0.54	0.23-1.27	0.158
Secondary incomplete	**0.22**	**0.09-0.52**	**0.001**	0.42	0.15-1.22	0.111
Secondary complete	**0.33**	**0.18-0.61**	**< 0.001**	0.65	0.28-1.48	0.304
University incomplete	**0.28**	**0.10-0.81**	**0.019**	0.66	0.18-2.50	0.543
University complete	**0.30**	**0.14-0.62**	**0.001**	0.79	0.32-1.95	0.609
Per capita household income						
> minimum wage	(Reference)				(Reference)	
⩽ minimum wage	**2.14**	**1.50- 3.08**	**< 0.001**	**1.65**	**1.08-2.53**	**0.021**
Paid employment						
Yes	(Reference)				(Reference)	
No	**7.35**	**4.80-11.25**	**< 0.001**	**9.75**	**6.12-15.53**	**< 0.001**
Region						
North	(Reference)				(Reference)	
Northeast	**1.74**	**1.05-2.86**	**0.030**	1.46	0.89-2.40	0.137
Midwest	1.41	0.76-2.59	0.273	1.55	0.84-2.88	0.164
Southeast	1.66	0.99-2.77	0.053	**1.81**	**1.06-3.09**	**0.030**
South	1.50	0.83-2.73	0.180	1.80	0.99-3.29	0.054
Urbanity						
Rural	(Reference)				(Reference)	
Urban	1.51	0.97-2.36	0.071	**1.93**	**1.19-3.11**	**0.007**
Living with a partner						
Yes	(Reference)					
No	**2.11**	**1.51-2.96**	**< 0.001**	**2.59**	**1.86-3.62**	**< 0.001**

Bold type denotes statistical significance.
The greatest correlation was between education and income, r_s= 0.35. Model fit indices: $F_{(18,7453)}$ = 13.09, Prob. > F = < 0.00.
OR = odds ratio.
[†] Average variance inflation factor = 1.94.

consistent in both men and women. However, it is noteworthy that the prevalence increased more significantly among middle-aged women than men, which might be explained by later onset in women, as discussed above.

The overrepresentation of individuals diagnosed with schizophrenia in the lower socioeconomic stratum has been previously described.[26,27] Two major hypotheses have been proposed to explain such an association. According to social causation theory, mental illnesses, such as schizophrenia, could result from greater exposure to adversity due to poverty. However, social selection theory suggests that the functional impairment resulting from mental illness could lead to socioeconomic decline.[28-30] A recent genetic study found a bidirectional relationship between schizophrenia and poverty, indicating that both pathways may contribute.[31] We identified not only the impact of poverty – manifested through factors such as lower income, unemployment, and lower educational attainment – but also a clear prevalence gradient within a sample whose overall income levels would already be considered low by the standards of studies conducted in high-income countries. This finding underscores the potential influence of an individual's relative

position within the broader social hierarchy, suggesting that the experience of socioeconomic disadvantage is not merely about absolute poverty but also by one's social standing in comparison to others. Although we cannot assert causality due to the cross-sectional nature of the sample, this finding appears even more relevant given the social and self-referential nature of schizophrenia symptoms.

Regarding employment, 17.8% of the individuals with schizophrenia in our study were employed. This is consistent with previous studies, which have reported employment rates ranging from 10-20%.[32-34] We also found lower educational status in individuals with schizophrenia. Over 53% of the schizophrenia group had no or incomplete basic education, compared with 34.7% among those without schizophrenia. Such educational disparities have been consistently found in the literature. A recent review revealed that in low- and middle-income countries, the educational gap between those with and without schizophrenia has increased over the years.[35] In patients with schizophrenia, limited education is an indicator of poverty, and may adversely affect cognition and employment.[31]

Comparative deficits in social adjustment, characterized by lower rates of stable relationships and employment, have been previously reported in individuals with schizophrenia.[36,37] Interestingly, these impairments are already evident prior to initial hospitalization. Some studies suggest that singleness or unemployment after adolescence could be risk factors for schizophrenia.[38] Alternatively, the association between social deficits and schizophrenia may arise from common underlying factors, such as poverty and low educational status. Another possibility is that social impairment occurs long before the full onset of the disease, reflecting the effects of subthreshold symptoms. Although the cross-sectional nature of our study precludes inferences of directionality, the findings are consistent with the current literature, highlighting the importance of providing social support to patients with schizophrenia.

Greater urbanicity and larger urban agglomerations are associated with a higher incidence of schizophrenia.[39] However, this association is not universal and depends on multiple factors.[40] Notably, previous studies in low- and middle-income countries have found no significant association between higher urbanicity and the prevalence of psychotic disorders.[41] Our contrasting finding in Brazil, that urbanicity is associated with schizophrenia, may reflect methodological differences from earlier studies (e.g., in the representativeness of the sampled population) and suggests that the pattern in low- and middle-income countries may be similar to that of wealthy countries.

As strengths and limitations, this study benefits from a large, nationally representative sample, which significantly enhances the generalizability of the findings to the broader population of Brazil. By incorporating detailed sociodemographic data, this study also provides a useful analysis of potential risk factors for schizophrenia, allowing for a deeper understanding of its prevalence across various subgroups. This rich dataset contributes to the identification of patterns and disparities within the population, which is crucial for informed public health policies.

However, some limitations must be considered. First, using a self-reported diagnosis of schizophrenia introduces potential recall bias or misclassification. As mentioned above, given the stigma surrounding mental health disorders, individuals may be reluctant to report a diagnosis of schizophrenia or may misinterpret or underreport their condition. This could lead to an underestimation of the true prevalence of schizophrenia in the population. Nevertheless, self-reporting a clinical schizophrenia diagnosis has been proposed as a reliable method for identifying cases in schizophrenia research.[18,42] This approach may reduce the burden on both participants and researchers by eliminating the need for extensive assessments.[18] For example, self-reported schizophrenia diagnoses among UK Biobank participants had a positive predictive value of 0.74 and revealed no significant differences in genetic liability compared to clinically-ascertained samples.[43] The authors suggested that self-reporting could improve the representativeness of future samples and increase sample sizes in genetic psychiatric studies.[18] Potential strategies to enhance the validity of prevalence estimates in future population-based studies include: 1) conducting validation studies with actively assessed sub-samples (e.g., clinical interviews or medical record verification); 2) triangulating self-reported data with administrative or registry-based sources; and 3) incorporating repeated assessments over time to strengthen reliability. Second, it is important to note that our study only included individuals residing in private households, excluding the institutionalized and the homeless. This could result in underestimation of the total prevalence of schizophrenia in the country. Third, we only estimated the prevalence in the adult population, excluding National Health Survey participants aged 15-17 years. This was done to ensure that our estimates are comparable with other studies focusing on adult populations and to improve the reliability of self-reported diagnoses, as both the likelihood of receiving an accurate diagnosis and the consistency of self-reported information are generally higher at older ages. Nevertheless, for readers interested in prevalence estimates that include younger individuals, the overall prevalence for those aged $\geqslant$ 15 years was 0.33% (95%CI 0.28-0.39), with a prevalence of 0.11% specifically among those aged 15-17. Fourth, the study's cross-sectional design limits the ability to make causal inferences. While associations between sociodemographic factors and schizophrenia diagnosis are evident, the directionality of these relationships cannot be established. Longitudinal studies would be necessary to explore the temporal dynamics and causal pathways between these factors and schizophrenia onset or diagnosis. Despite adjustment for several confounders, unmeasured influences, such as genetic predisposition, lifestyle choices, or other social determinants, and well-documented contextual risks (e.g., urbanization, air pollution, migration, maternal famine, violence, substance use) could still shape both sociodemographic patterns and the likelihood of a schizophrenia diagnosis, particularly in socially vulnerable

settings.[44,45] The inclusion of additional factors in future research could provide a more robust understanding of the complexities underlying the observed associations.

The greater exposure to adversity in low- and middle-income countries underscores the importance of understanding the prevalence schizophrenia and its associated factors to help elucidate the disorder's pathophysiological mechanisms.[44,45] Importantly, our findings emphasize the significant association between schizophrenia prevalence estimates and social conditions. While causality cannot be inferred, the data highlight the social vulnerability of this population as a crucial factor in shaping their lived experiences, including their access to care.

The 0.34% lifetime estimated prevalence of schizophrenia translates to 547,202 individuals living with the disorder in Brazil. While this figure already represents a substantial population group, the social impact is far greater considering the affected family members. Beyond health care provision, our data suggest that social support has a critical role in promoting better outcomes for these individuals.

Future longitudinal studies should further explore the associations identified in this study to clarify directionality. Intervention studies could confirm the importance of social support in modifying prevalence estimates or improving outcomes for patients with schizophrenia.

Disclosure

CUC has been a consultant and/or advisor to or has received honoraria from AbbVie, Alkermes, Allergan, Angelini, Aristo, Autobahn, Boehringer-Ingelheim, Bristol-Meyers Squibb, Cardio Diagnostics, Cerevel, CNX Therapeutics, Compass Pathways, Darnitsa, Delpor, Denovo, Draig, Eli Lilly, Eumentis Therapeutics, Gedeon Richter, GH, Hikma, Holmusk, IntraCellular Therapies, Jamjoom Pharma, Janssen/J&J, Karuna, LB Pharma, Lundbeck, MedInCell, MedLink, Merck, Mindpax, Mitsubishi Tanabe Pharma, Maplight, Mylan, Neumora Therapeutics, Neuraxpharm, Neurocrine, Neurelis, NeuShen, Newron, Noven, Novo Nordisk, Orion Pharma, Otsuka, PPD Biotech, Recognify Life Science, Recordati, Relmada, Response Pharmaeutical, Reviva, Rovi, Saladax, Sanofi, Seqirus, Servier, Sumitomo Pharma America, Sunovion, Sun Pharma, Supernus, Tabuk, Takeda, Teva, Terran, Tolmar, Vertex, Viatris and Xenon Pharmaceuticals; has provided expert testimony for Janssen, Lundbeck, Neurocrine, and Otsuka; has served on a Data Safety Monitoring Board for Compass Pathways, IntraCellular Therapies, Relmada, Reviva, and Rovi; has received grant support from Boehringer-Ingelheim, Janssen, and Takeda; has received royalties from UpToDate; and is a stock option holder of Cardio Diagnostics, Kuleon Biosciences, LB Pharma, MedLink Global, Mindpax, Quantic, and Terran.

The other authors report no conflicts of interest.

Data availability statement

The data that support this study are available from the authors upon request.

Author contributions

AG: Conceptualization, Methodology, Writing – original draft, Writing – review & editing.
CZ: Conceptualization, Methodology, Formal data analysis, Writing – original draft, Writing – review & editing.
PGL: Data interpretation, Writing – review & and editing.
NRS: Visualization, Writing – review & editing.
AFC: Data curation, Interpretation, Writing – review & editing.
DMOR: Data curation, Interpretation, Writing – review & editing.
CUC: Data interpretation, Writing – review & and editing.
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Handling Editor: Alexandre Loch

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